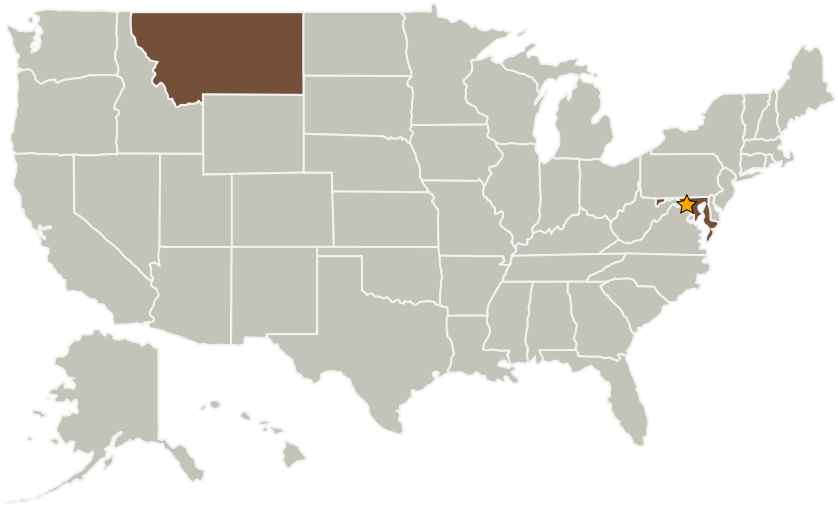
Monolithic, High-Speed Fiber-Optic Switching Array for Lidar, Phase II

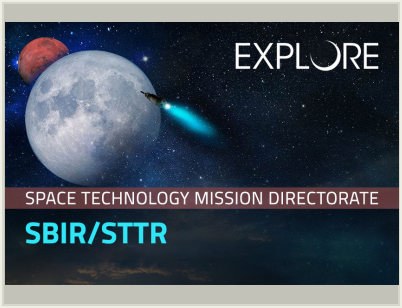
Completed Technology Project (2005 - 2007)

Project Introduction

This NASA SBIR Phase II effort will develop a 1 x 10 prototype non-mechanical fiber optic switch for use with high power lasers. The proposed optical device is a fiber-based multi-channel switch to rapidly switch a fiber-coupled laser among ten output channels as an integral part of a fiber-based fixed-array laser transmitter for next-generation NASA lidar systems. The key innovation is the use of an arrangement of electro-optic prisms in a nonlinear optical crystal created through domain reversal to direct the laser into one of many possible output fibers. This design will provide several important features that are required yet not currently available in a fiber switch in order to achieve a fiber-arrayed lidar source. These features include high optical power handling, reduced crosstalk, low optical loss, fast switching times, low power consumption, and robust construction in a monolithic package with no moving parts. A packaged device will undergo preliminary flight qualification testing and reliability analysis. The Phase II effort will deliver a compact, packaged 1x10 electro-optic fiber switch that meets specifications and is ready for testing in a NASA all-fiber lidar system.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland
ADVR, Inc.	Supporting Organization	Industry	Bozeman, Montana

Primary U.S. Work Locations	
Maryland	Montana

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.5 Lasers